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TRANSACTIONS OF THE YORKSHIRE NATURALISTS' UNION.
PART 18,
ISSUED TO MEMBERS FOR THE YEAR 1892.

THE YORKSHIRE CARBONIFEROUS FLORA

BY

ROBERT KIDSTON, F.R.S.E., F.G.S.

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LEEDS:
PRINTED FOR THE YORKSHIRE NATURALISTS' UNION
BY TAYLOR BROTHERS.

MAY 1893.

TRANSACTIONS

OF THE

Yorkshire Naturalists' Union.

PART 19 (for 1893)

will include Mr. A. E. HALL's valuable Report on Yorkshire Lepidoptera observed in 1891, and a continuation of Messrs. W. NELSON and JOHN W. TAYLOR's Annotated List of the Land and Freshwater Mollusca known to inhabit Yorkshire.

PROPOSED DOUBLING OF MEMBERSHIP.

The Members are reminded of the effort which is now being made to double the total number of members. The progress of the works which the Union has in hand for publication, including Baker's North Yorkshire, Kidston's Reports on the Yorkshire Carboniferous Flora, Hey's List of Yorkshire Coleoptera, Clarke's List of Yorkshire Birds, Nelson and Taylor's List of Yorkshire Land and Freshwater Mollusca, is delayed by the want of funds available for the purpose.

A general co-operation of those who are already members and who would use their influence with friends, would enable the membership to be doubled at once with ease, but it is necessary that such co-operation be prompt and general. The Secretaries will gladly furnish circulars and forms of nomination.

20th May 1893.

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THE CARBONIFEROUS FLORA OF YORKSHIRE.

SECOND REPORT

On behalf of the Yorkshire Fossil Flora Committee, for 1890.

ROBERT KIDSTON, F.R.S.E., F.G.S.

Since giving in the last Report, at the Hull Meeting, in November, 1889, I have to note the occurrence of ten *species* not previously known to occur in Yorkshire, and of these some are new to Britain. They have all been collected by Mr. W. Hemingway, to whom, for his continued successful labours, the Committee owe so much for their knowledge of the Yorkshire Carboniferous Flora. In addition to the records of the species new to Yorkshire, Mr. Hemingway has added many new *localities* for those already recorded.

The Committee are also indebted to Mr. James Spencer, Halifax, whose collection has afforded several new *localities* for species included in the first Report.

In addition to the records in this Report, there are still some specimens awaiting further examination which, owing to several circumstances, must be held over. In some cases these species have been excluded meanwhile, awaiting the opportunity of comparing them with authentic specimens of the species to which they are believed to belong.

For the assistance given by Mr. Spencer and Mr. Hemingway the Committee return their hearty thanks.

The Committee again take this opportunity of appealing to Yorkshire Geologists for assistance in carrying on their investigations.

SYNOPSIS OF ADDITIONAL SPECIES AND LOCALITIES.

CALAMARIÆ.

CALAMITES Suckow.

Group I.—CALAMITINA Weiss.

Calamitina (Calamites) varians Sternb.

First Report, p. 16.

Additional locality.

Middle Coal Measures.

Hor.—*Shale immediately underneath Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

Calamitina (Calamites) varians var. **schutzei** Stur. sp.

Calamites schützei Stur. Sitzb. d. k. akad. d. Wissensch., vol. lxxxiii., p. 416, pl. i., fig. 1.

Calamites (*Calamodendron*) *schützei* Zeiller, Flore foss. d. bassin houil. d. Valen., p. 350, pl. lv., fig. 4.

Calamites (Calamitina) cf. schützei Weiss, Steinkohlen Calamarien, part II., pp. 79 and 80, pls. xxi., fig. 5, and xxvii., fig. 2.

Middle Coal Measures.

Hor.—*Oaks Rock.* Loc.—Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Locs.—Monckton Main Colliery, near Barnsley (Hemingway); East Gawber Colliery, near Barnsley (Hemingway); Woolley Edge Colliery, Darton, near Barnsley (Hemingway).

Lower Coal Measures.

Hor.—*Elland Flagstone.* Loc.—Northowram, Halifax (Spencer).

Calamitina (Calamites) göpperti Ett. sp.

First Report, p. 16.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

GROUP II.—EUCALAMITES WEISS.

Eucalamites ramosus Artis sp.

First Report, p. 17.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Houghton Common Rock.* Loc.—Brierley Common, near Barnsley (Hemingway).

Hor.—*Shale over Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

LOWER COAL MEASURES.

Hor.—*Elland Flagstones.* Loc.—Ringby, near Halifax (Spencer).

GROUP III.—STYLOCALAMITES WEISS.

Stylocalamites suckowii Brongt. sp.

First Report, p. 19.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Shale over Woolley Edge Rock.* Loc.—Oaks Colliery, Barnsley (Hemingway).

Hor.—*Rock over Barnsley Thick Coal.* Loc.—Cooper's Pit, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Hor.—*Silkstone Coal.* Loc.—Church Lane Colliery, near Barnsley (Hemingway).

LOWER COAL MEASURES.

Hor.—*Elland Flagstones.* Loc.—Ringby, Halifax (Spencer).

Stylocalamites undulatus Sternb. sp.

First Report, p. 20.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Stylocalamites cistii Brongt. sp.

First Report, p. 21.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Shale over Woolley Edge Rock.* Loc.—Oaks Colliery, Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

CALAMOCLADUS SCHIMPER.

Calamocladus equisetiformis Schl. sp.

First Report, p. 22.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Shale over Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

Hor.—*Rock over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Calamocladus longifolius Sternb. sp.

Bruckmannia longifolia Sternb., Ess. Flore monde prim., i., fasc. iv., p. xxix., pl. lviii., fig. 1.

Asterophyllites longifolia Geinitz, Vers. d. Steinkf. in Sachsen, p. 9, pl. xviii., figs. 2—3.

Asterophyllites longifolius Zeiller, Flore foss. d. bassin houil. d. Valen., p. 374, pl. lix., fig. 3.

Calamocladus longifolius Schimper, Traité d. paléont. végét., vol. i., p. 323.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—East Gawber Colliery, near Barnsley (Hemingway); Monckton Main Colliery, near Barnsley (Hemingway).

ANNULARIA STERNB.

Annularia sphenophylloides Zenker sp.

Galium sphenophylloides Zenker, Neues Jahrb., 1833, p. 398, pl. v., figs. 6—9.

Annularia sphenophylloides Kidston, Trans. Roy. Soc. Edin., vol. xxxiii., p. 344.

MIDDLE COAL MEASURES.

Hor.—*Shale over Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

SPHENOPHYLLEÆ.

SPHENOPHYLLUM BRONGT.

Sphenophyllum cuneifolium Sternb. sp.

First Report, p. 25.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Ackworth Rock.* Loc.—Brierley, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Locs.—Denaby Main Colliery, near Rotherham (Hemingway); South Kirby Colliery, near Pontefract (Hemingway).

Var. saxifragæfolium.

First Report, p. 26.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Sphenophyllum majus Bronn.

First Report, p. 26.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Sphenophyllum trichomatosum Stur.

First Report, p. 27.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

FILICACEÆ.

SPHENOPTERIS BRONGT.

Sphenopteris obtusiloba Brongt.

First Report, p. 28.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Sphenopteris spinosa Göpp.

First Report, p. 29.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—Barnsley Thick Coal. Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Sphenopteris laurenti Andræ.

First Report, p. 30.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Sphenopteris footneri Marrat.

First Report, p. 31.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Sphenopteris sternbergii Ett. sp.

First Report, p. 31.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—Monckton Main Colliery, near Barnsley (Hemingway); South Kirby Colliery, near Pontefract (Hemingway).

RENAULTIA Zeiller.

Renaultia schatzlarensis Stur sp.

First Report, p. 32.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Pit, Worsborough Dale, near Barnsley (Hemingway).

ZEILLERIA Kidston.

Zeilleria delicatula Sternb. sp.

Sphenopteris delicatula Sternb., Ess. Flore monde prim., i., fasc. ii., p. 34; fasc. iv., p. xvi., pl. xxvi., fig. 5.

Zeilleria delicatula Kidston, Quart. Journ. Geol. Soc., vol. xl., p. 592, pl. xxv.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

CROSSOTHECA Zeiller.

Crossotheca schatzlarensis Stur sp.

First Report, p. 33.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

URNATOPTERIS Kidston.

Urnatopteris tenella Brongt. sp.

First Report, p. 34.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

MARIOPTERIS Zeiller.

Mariopteris muricata Schl. sp.

First Report, p. 34.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Hor.—*Black Bed Ironstone.* Loc.—Low Moor (Spencer).

Millstone Grit.

Hor.—*Third Grit of series.* Loc.—Luddenden, Halifax (Spencer).

PECOPTERIS Brongt.

Pecopteris miltoni Artis sp.

First Report, p. 36.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Pecopteris volkmanni Sauveur.

First Report, p. 37.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

ALETHOPTERIS STERNB.

Alethopteris lonchitica Schl. sp.

First Report, p. 37.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Hor.—*Black Bed Coal.* Loc.—Low Moor (Spencer).

Alethopteris decurrens Artis sp.

First Report, p. 38.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Alethopteris davreuxi Brongt. sp.

Pecopteris davreuxi Brongt., Hist. d. végét. foss., p. 279., pl. lxxxviii., figs. 1—2.

Alethopteris davreuxi Zeiller, Flore foss. d. bassin houil. d. Valen., p. 228, pl. xxxii., fig. 1.

Alethopteris davreuxi Kidston, Trans. Roy. Soc. Edin., vol. xxxiii., p. 386, pl. xxiv., fig. 1.

Pecopteris dournaisii Brongt., Hist. d. végét. foss., p. 282, pl. lxxxix., fig. 1 (? fig. 2).

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

ODONTOPTERIS BRONGT.

Odontopteris britannica Gutbier.

First Report, p. 39.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Odontopteris binervosa Achep.

First Report, p. 39.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—Monckton Main Colliery, near Barnsley (Hemingway); South Kirby Colliery, near Pontefract (Hemingway).

NEUROPTERIS BRONGT.

Neuropteris heterophylla Brongt.

First Report, p. 40.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Locs.—Denaby Main Colliery, near Rotherham (Hemingway); South Kirby Colliery, near Pontefract (Hemingway).

Neuropteris grangeri Brongt.

Neuropteris grangeri Brongt., Hist. d. végét. foss., p. 237, pl. lxviii. fig. 1.

Neuropteris grangeri Lesquereux, Coal Flora, p. 105, pl. xiii., fig. 9.

Neuropteris grangeri Zeiller, Flore fossile—Bassin houiller et permien d'Autun et l'Epinac, p. 145, pl. xi., fig. 6, 1890.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Neuropteris tenuifolia Schl. sp.

First Report, p. 41.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Neuropteris rarinervis Bunbury.

First Report, p. 41.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Shale over Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

Neuropteris gigantea Sternb.

First Report, p. 41.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Denaby Colliery, near Rotherham (Hemingway).

Neuropteris obliqua Brongt. sp.

First Report, p. 42.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Neuropteris osmundæ Artis sp.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

RHACOPHYLLUM Schimper.

Rhacophyllum crispum Gutb. sp. var. **lineare** Gutb. sp.

First Report, p. 43.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

LYCOPODIACEÆ.

LEPIDODENDRON Sternb.

Lepidodendron ophiurus Brongt.

First Report, p. 45.

Additional localities.

Middle Coal Measures.

Hor.—*Milton Field or Half-yard Coal.* Loc.—Hoyle Mill, Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—Denaby Main Colliery, near Rotherham (Hemingway).

Lepidodendron obovatum Sternb.

First Report, p. 46.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Lower Coal Measures.

Hor.—*Hard Bed Coal.* Loc.—Sunnybank, Halifax (Spencer).

Lepidodendron aculeatum Sternb.

First Report, p. 46.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Lower Coal Measures.

Hor.—*Hard Bed Coal.* Loc.—Low Moor (Spencer).

Lepidodendron wortheni Lesqx.

First Report, p. 48.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Milton Field or Half-yard Coal.* Loc.—Hoyle Mill, Barnsley (Hemingway).

LEPIDOPHLOIOS STERNB.

Lepidophloios acerosus L. & H. sp.

First Report, p. 49.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

LOWER COAL MEASURES.

Hor.—*Hard Bed Coal.* Loc.—Bradshaw, Halifax (Spencer).

LEPIDOSTROBUS BRONGT.

Lepidostrobus lanceolatus L. & H. sp.

First Report, p. 50.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Rock, over Barnsley Thick Coal.* Loc.—Cooper's Colliery, Worsborough Dale, near Barnsley (Hemingway).

BOTHRODENDRON L. & H.

Bothrodendron minutifolium Boulay sp.

First Report, p. 52.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Milton Field or Half-yard Coal.* Loc.—Hoyle Mill, Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

LEPIDOPHYLLUM Brongt.

Lepidophyllum majus Brongt.

First Report, p. 53.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

SIGILLARIA Brongt.

Sigillaria discophora König sp.

First Report, p. 53.

Additional locality.

Lower Coal Measures.

Hor.—*Hard Bed Coal.* Loc.—Bank Top, Halifax (Spencer).

Sigillaria mamillaris Brongt.

First Report, p. 54.

Additional locality.

Lower Coal Measures.

Hor.—*Hard Bed Coal.* Loc.—Bradshaw, Halifax (Spencer).

Sigillaria ovata Sauveur.

First Report, p. 56.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Sigillaria principis Weiss.

Sigillaria principis Weiss, Aus der Flora der Skeinkohl., p. 5, p. i., fig. 8.

Sigillaria principis Zeiller, Flore foss. d. bassin houil. d. Valen., p. 529, pl. lxxix., figs. 1—2.

Sigillaria principis Kidston, Trans. Roy. Soc. Edin., vol. xxxiii., p. 413, pl. xxviii., figs. 6—8.

MIDDLE COAL MEASURES.

Hor.—*Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

Sigillaria camptotœnia Wood sp.

Asolanus camptotœnia Wood, Proc. Acad. Nat. Sc. Philadelph., 1860, p. 238, pl. iv., fig. 1.

Sigillaria camptotœnia Wood, Trans. Amer. Phil. Soc., vol. xiii., p. 342, pl. ix., fig. 3.

Sigillaria camptotœnia Zeiller, Flore foss. d. bassin houil. d. Valen., p. 588, pl. lxxxviii., figs. 4—6.

Sigillaria monostigma Lesqx., Coal Flora, p. 468, pl. lxxiii., figs. 3—6.

Sigillaria rimosa Gold. (not Sauveur), Flora Saræp. foss., Heft ii., pp. 22 and 56, pl. vi., figs. 1—4; Heft iii., p. 42, pl. xii., figs. 7—8.

Lepidodendron barbatum Roemer, Palæont., vol. ix., p. 40, pl. viii., fig. 12.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

Sigillaria tessellata Brongt.

First Report, p. 57.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

STIGMARIA BRONGT.

Stigmaria reticulata Göpp.

First Report, p. 58.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—Denaby Main Colliery, near Rotherham (Hemingway); East Gawber Colliery, near Barnsley (Hemingway).

Note.—Mr. Hemingway informs me that this is the most common *Stigmaria* in the *Barnsley Thick Coal* and *Silkstone Coal Shales.*

CORDAITEÆ.

CORDAITES Unger.

Cordaites principalis Germar sp.

First Report, p. 58.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Cordaites borassifolius Sternb. sp.

Cordaites borassifolius Unger, Genera et species, p. 277.

Cordaites borassifolius Heer, Flora foss. Helv., p. 54, pl. xvii., figs. 14—17.

Cordaites borassifolius Zeiller, Flore foss. d. bassin houil. d. Valen., p. 625, pl. xcii., figs. 1—6.

Flabellaria borassifolia Sternb., Ess. Flore monde prim., i., fasc. ii., pp. 31 and 36., pl. xviii.; fasc. iv., p. xxxiv.

Middle Coal Measures.

Hor.—*Shale over Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

ARTISIA Sternberg.

Artisia transversa Artis sp.

First Report, p. 59.

Additional localities.

Middle Coal Measures.

Hor.—*Shale above Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough (Hemingway).

MILLSTONE GRIT.

Hor.—*Third Grit of Series.* Loc.—Luddenden, Halifax (Spencer).

CORDAIANTHUS GRAND'EURY.

Cordaianthus pitcairniæ L. & H. sp.

First Report, p. 59.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

Cordaianthus volkmani Ett. sp.

First Report, p. 60.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

CARDIOCARPUS BRONGT.

Cardiocarpus subacutus Grand'Eury sp.

Samaropsis subacutus Grand'Eury, Flore carb. du Départ. de la Loire, p. 281, pl. xxxiii., fig. 5.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley (Hemingway).

TRIGONOCARPUS BRONGT.

Trigonocarpus parkinsoni Brongt.

First Report, p. 61.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Milton Field or Half-yard Coal.* Loc.—Hoyle Mill, Barnsley (Hemingway).

Hor.—*Barnsley Thick Coal.* Loc.—Denaby Main Colliery, near Rotherham (Hemingway).

Var. **amygdalæformis** Göpp. & Berger sp.

First Report, p. 61.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

RHABDOCARPUS GÖPP. & BERGER.

Rhabdocarpus elongatus Kidston.

First Report, p. 63.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

CARPOLITHUS STERNB.

Carpolithus inflatus Lesqx.

First Report, p. 63.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract (Hemingway).

THE CARBONIFEROUS FLORA OF YORKSHIRE.

THIRD REPORT

ON BEHALF OF THE YORKSHIRE FOSSIL FLORA COMMITTEE, 1891.

ROBERT KIDSTON, F.R.S.E., F.G.S.

IN presenting the Third Report of the Fossil Flora Committee, I have again the pleasure of recording the occurrence of several species not previously known to occur in the Yorkshire coal measures.

These are:—*Palæostachya elongata* Presl sp.; *Stach-annularia* (?) *northumbriana* Kidston; *Sphenopteris jacquoti* Zeiller; *Sphen. marratii* Kidston; *Sphen. rotundifolia* Andræ; *Zeilleria delicatula* Sternb. sp.; *Eremopteris artemisiæfolia* Sternb. sp.; *Neuropteris acuminata* Schl. sp.; *Bothrodendron punctatum* L. & H.; *Sigillaria polyploca* Boulay; *Sig. saullii* Brongt.; *Sig. reniformis* Brongt.; *Sig. lævigata* Brongt.; and *Sig. tenuis* Achepohl. Of these, *Palæostachya elongata*, *Sph. jacquoti*, and *Sph. rotundifolia* are new to Britain, and though I have previously met with *Sig. polyploca* and *Sig. tenuis* in Britain, they are not included in any published list. With the exception of one record from Mr. Spencer, we are indebted to Mr. W. Hemingway for all the other records contained in this Report.

It is much to be regretted that a greater number of the Yorkshire geologists do not take more interest in the collection of the coal plants. At present sinking operations are being carried on and new pits opened out in several localities. When

these operations are completed we may expect a period of less activity in this direction, and it is very much to be regretted if full advantage of the present favourable opportunities for increasing the knowledge of the coal flora be allowed to slip. In addition to the new pits being sunk in the neighbourhood of Barnsley, I believe one is to be put down shortly in the Doncaster district, and others at Rotherham and near Featherstone.[1]

Should full advantage be taken of the present opportunities of securing fossil plants from the Yorkshire coal field, there is little doubt that the next Report will contain many records of great interest.

(1) As reported in the *Barnsley Independent*, Nov. 21, 1891.

LIST OF ADDITIONAL RECORDS

CALAMARIÆ.

CALAMITES Suckow.

Calamitina (Calamites) varians Sternb.

Calamitina (Calamites) varians. Ante, pp. 16 & 66.

Middle Coal Measures.

Hor.—*Melton Field Coal.* Loc.—Hoyle Mill, Barnsley.

Eucalamites (Calamites) ramosus Artis.

Eucalamites ramosus. Ante, pp. 17 & 67.

Middle Coal Measures.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Stylocalamites (Calamites) suckowii Brongt.

Stylocalamites suckowii. Ante, pp. 19 & 67.

Middle Coal Measures.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Stylocalamites (Calamites) undulatus Sternb.

Stylocalamites undulatus. Ante, pp. 20 & 68.

Middle Coal Measures.

Hor.—*Melton Field Coal.* Loc.—Hoyle Mill, Barnsley.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery, Wakefield.

Note.—Mr. Hemingway informs me that this is the most common species of Calamite in the Barnsley district.

Stylocalamites (Calamites) cistii Brongt.

Stylocalamites cistii. Ante, pp. 21 & 68.

Middle Coal Measures.

Hor.—*Melton Field Coal.* Loc.—Hoyle Mill, Barnsley.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

CALAMOCLADUS Schimper.

Calamocladus equisetiformis Schl. sp.

Calamocladus equisetiformis. Ante, pp. 22 & 68.

Middle Coal Measures.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Hor.—*Haigh Moor Coal.* Loc.—Hoyle Mill, Barnsley.

Calamocladus charæformis Sternb. sp.

Calamocladus roehli Stur. Ante, p. 22.

Bechera charæformis Sternb., Ess. Fl. monde prim., vol. i., fasc. iv., p. xxx., pl. lv., figs. 3—5.

Bechera charæformis Morris, Trans. Geol. Soc., 2nd ser., vol. v., expl. to pl. xxxviii., fig. 2, 1840.

Bechera delicatula Roehl (not Sternb.), Foss. Flora d. Steinkf. Westphalens, p. 26, pls. ii., fig. 6; iii., figs. 1 $^{a, b, c}$; 2 $^{a, b}$; 3, iv. fig. 1 ^{c}.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—Denaby Main Colliery, near Rotherham; Monckton Main Colliery, near Barnsley.

Remarks.—The examination of additional specimens, both from Shropshire and Yorkshire, has convinced me that the *Calamocladus roehli* must be placed as a synonym under *Calamocladus charæformis* Sternb. sp.

PALÆOSTACHYA Weiss.

Palæostachya elongata Presl sp.

Volkmannia elongata Presl, Verhandl. d. Gesellschaft des väterländischen Museums in Böhmen, 1838, p. 27, pl. i. (fide Weiss).

Palæostachya elongata Weiss, Steinkohlen Calamarien, vol i., 1876, p. 108, pl. xv.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

NOTE.—This species is represented by a single slab containing several cones.

STACHANNULARIA WEISS.

Stachannularia (?) northumbriana Kidston.

Stachannularia (?) *northumbriana* Kidston, Proc. Roy. Phys. Soc. Edin., vol. x., p. 353.

Asterophyllites tuberculata L. & H. (not Sternb.), Fossil Flora, vol. i., pl. xiv., vol. iii., pl. clxxx.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

NOTE.—I have re-figured and described this species in a paper read before the Royal Society of Edinburgh, vol. xxxvii.

SPHENOPHYLLEÆ.

SPHENOPHYLLUM BRONGT.

Sphenophyllum cuneifolium. Ante, pp. 25 & 69.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

Sphenophyllum trichomatosum Stur.

Sphenophyllum trichomatosum. Ante, pp. 27 & 70.

Hor.—*Stone over Barnsley Thick Coal.* Loc.—Worsborough Dale, near Barnsley.

FILICACEÆ.

SPHENOPTERIS BRONGT.

Sphenopteris jacquoti Zeiller sp.

Diplothmema jacquoti Zeiller, Flore foss. d. bassin houil. d. Valen., p. 157, pl. xviii., figs. 3—6.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—South Kirby Colliery, near Pontefract; Monckton Main Colliery, near Barnsley.

Sphenopteris marratii Kidston.

Sphenopteris marratii Kidston, Trans. Roy. Soc. Edin., vol. xxxv., p. 403, pl. ii., figs. 1—2.

Sphenopteris gymnogrammides. Proc. Liverpool Nat. Field Club for 1870—71; frontispiece, fig. 1, 1871.

Sphenopteris trifoliolata Marrat (*not* Artis), Proc. Liverpool Geol. Soc., Session 13, 1871—2, p. 98, 1872.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Woolley Colliery, Darton, near Barnsley.

Sphenopteris rotundifolia Andræ.

Sphenopteris rotundifolia Andræ, Vorwelt. Pflanzen, p. 37, pl. xii.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

Note.—A single specimen has been found.

ZEILLERIA Kidston.

Zeilleria delicatula Sternb. sp.

Zeilleria delicatula Kidston, Quart. Journ. Geol. Soc., vol. xv., p. 59, pl. xxv.

Zeilleria delicatula Kidston, Trans. Roy. Soc. Edin., vol. xxxv., p. 403.

Sphenopteris delicatula Sternb., Ess. fl. monde prim., i., fasc. ii., p. 34, pl. xxvi., fig. 5; fasc. iv., p. xvi.

Sphenopteris meifolia Sternb., ibid., vol. ii., p. 56, pl. xx., fig. 5.

Cheilanthites meifolius Göpp., Syst. fil. foss., p. 241.

Cheilanthites meifolius var. *trifidus* Göpp., ibid., p. 241, pl. xv., figs. 3—4.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

EREMOPTERIS Schimper.

Eremopteris artemisiæfolia Sternb. sp.

Eremopteris artemisiæfolia Schimper, Traité d. paléont. végét., vol. i., p. 416, pl. xxx., fig. 5.

Lesquereux, Coal Flora, i., p. 293, pl. liii., figs. 5—6.

Sphenopteris artemisiæfolia Sternb., Ess. fl. monde prim., vol. i., fasc. iv., p. xv., pl. liv., fig. 1.

Sphenopteris artemisiæfolia Brongt., Prodrome, p. 50.

Sphenopteris artemisiæfolia Brongt., Hist. d. végét. foss., p. 176, pls. xlvi., xlvii., figs. 1—2.

Sphenopteris artemisiæfolia Lebour, Illustr. of Fossil Plants, p. 67, pl. xxxiii.

Sphenopteris crithmifolia L. & H., Fossil Flora, vol. i., pl. xlvi.

Sphenopteris stricta Brongt., Hist. d. végét. foss., p. 208, pl. xlviii., fig. 2.

Sphenopteris stricta Sternb., ibid., i., fasc. iv., p. xv., pl. lvi., fig. 3, vol. ii., p. 37.

Asplenioides obtusum König, Icones foss. sectiles, pl. xvi., fig. 199.

Sphenopteris sp. Lebour, ibid., pls. xxxiv., xxxv., xxxvi.

Middle Coal Measures.

Hor.—*Shale over Ackworth Rock.* Loc.—Cadeby Colliery, Conisborough.

MARIOPTERIS Zeiller.

Mariopteris muricata Schl. sp.

Mariopteris muricata. Ante, pp. 34 & 72.

Middle Coal Measures.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

ALETHOPTERIS Sternb.

Alethopteris lonchitica Schl. sp.

Alethopteris lonchitica. Ante, pp. 37 & 73.

MIDDLE COAL MEASURES.

Hor.—*Melton Field Coal.* Loc.—Hoyle Mill, Barnsley.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Alethopteris decurrens Artis sp.

Alethopteris decurrens. Ante, pp. 38 & 73.

MIDDLE COAL MEASURES.

Hor.—*Melton Field Coal.* Loc.—Hoyle Mill, Barnsley.

Alethopteris davreuxi Brongt.

Alethopteris davreuxi. Ante, p. 73.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Woolley Colliery, Darton, near Barnsley.

Alethopteris valida Boulay.

Alethopteris valida. Ante, p. 39.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, Pontefract.

NEUROPTERIS BRONGT.

Neuropteris heterophylla Brongt.

Neuropteris heterophylla. Ante, pp. 40 & 74.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery, Wakefield.

Hor.—*Barnsley Thick Coal.* Loc.—Hoyle Mill, Barnsley.

Neuropteris grangeri Brongt.

Neuropteris grangeri. Ante, p. 74.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—East Gawber Colliery, Barnsley.

Neuropteris tenuifolia Schl. sp.

Neuropteris tenuifolia. Ante, pp. 41 & 75.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery, Wakefield.

Neuropteris gigantea Sternb.

Neuropteris gigantea. Ante, pp. 41 & 75.

MIDDLE COAL MEASURES.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Hor.—*Haigh Moor Coal.* Loc.—Haigh, near Barnsley.

Neuropteris osmundæ Artis sp.

Neuropteris osmundæ. Ante, pp. 42 & 75.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery, Wakefield.

Neuropteris acuminata Schl. sp.

Neuropteris acuminata Zeiller, Flore foss. d. bassin houil. d. Valen., p. 255, pl. xli., fig. 4.

Neuropteris acuminatus Brongt., Prodrome, p. 53.

Neuropteris acuminatus Brongt., Hist. d. végét. foss., p. 229, pl. lxiii., fig. 4.

Neuropteris acuminatus L. & H., Fossil flora, vol. 1, pl. li.

Filicites acuminatus Schl., Petrefactenk., p. 412, pl. xvi., fig. 4.

Osmunda (?) smilacifolia Sternb., Ess. fl. monde prim., vol. i., fasc. ii., p. 37.

Osmunda smilacifolia König, Icones foss. sectiles, pl. xv., fig. 186.

Neuropteris smilacifolia Sternb., ibid., i., fasc. iv., p. xvi.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery Wakefield.

LYCOPODIACEÆ.

LEPIDODENDRON STERNB.

Lepidodendron aculeatum Sternb.

Lepidodendron aculeatum. Ante, pp. 46 & 76.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery, Wakefield.

Lepidodendron wortheni Lesqx.

Lepidodendron wortheni. Ante, pp. 48 & 77.

MIDDLE COAL MEASURES.

Hor.—*Haigh Moor Coal.* Loc.—Haigh, near Barnsley.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

LEPIDOSTROBUS BRONGT.

Lepidostrobus anthemis König sp.

Lepidostrobus anthemis. Ante, p. 51.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

BOTHRODENDRON L. & H.

Bothrodendron punctatum L. & H.

Bothrodendron punctatum. Fossil Flora, vol. ii., pls. lxxx—lxxxi.

Bothrodendron punctatum Zeiller, Ann. d. Sc. Nat., 6$^{e.}$ sér., Bot., vol. xiii., p. 224, pl. ix., figs. 1—3, pl. x., figs. 1—14.

Bothrodendron punctatum Zeiller, Bull. Soc. Géol. d. France, 3$^{e.}$ ser., vol. xiv., p. 178, pl. viii., figs. 1—3.

Bothrodendron punctatum Zeiller, Végét. foss. d. bassin houil. d. Valen., p. 487, pl. lxxv., figs. 1—2, pl. lxxvi., fig. 1.

Bothrodendron punctatum Zeiller, Végét. foss. d. terr. houil., p. 116.

Bothrodendron punctatum Renault, Cours. d. botan. foss., vol. ii., p. 52, pl. xi., fig. 4.

Bothrodendron punctatum Kidston, Proc. Roy. Phys. Soc. Edin., vol. x., p. 364.

Ulodendron lindleyanum Presl in Sternb., Vers. ii., p. 185, pl. xlv., fig. 4.

Ulodendron punctatum Schimper, Traité d. paléont. végét., vol. ii., p. 42.

Halonia punctata Feistm., Vers. d. böhm. kohlenab., abth. ii., p. 20. (? pl. xviii. *Excl. explanation on plate.*)

Rhytidodendron punctatum Kidston, Ann. Mag. Nat. Hist., vol. xvi., p. 174.

Ulodendron schlegelii Eichwald, Urw. Russl., vol. i., p. 81, pl. 3, fig. 4.

(?) *Ulodendron conybearii* Buckland, Geol. and Miner., vol. ii., p. 94, pl. lvi., fig. 6[1].

Ulodendron transversum Carr (*not* Eichwald), Monthly Mic. Journ., vol. iii., pl. xliv., 2.

Arthrocladion rhodii Sauveur, Végét. foss. d. terr. houil. Belgique, pl. lxvi.

Lepidodendron tenerrimum Auerbach & Trautschold, Nouv. Mém. Soc. Imp. des Natur. de Moscou, vol. xiii., pp. 40 and 45, pl. iii., figs. 1—3.

Middle Coal Measures..

Hor.—*Stanley Main Coal.* Loc.—Parkhill Colliery, Wakefield.

Remarks.—This species, which appears to be very rare in the Yorkshire Coal Field, is easily distinguished from *Sigillaria discophora* König sp., by the eccentric umbilicus of the large scars.

SIGILLARIA Brongt.

Sigillaria polyploca Boulay.

Sigillaria polyploca Boulay, Terr. houil. du Nord de la France, p. 47, pl. ii., fig. 8.

Sigillaria polyploca Zeiller, Ann. d. Sc. Nat., 6$^{e.}$ ser., Botan., vol. xix., p. 264, pl. xi., fig. 2.

Sigillaria polyploca Zeiller, Flore foss. d. bassin houil. d. Valen., p. 540, pl. lxxxii., figs. 7—8.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Woolley Colliery, Darton, near Barnsley.

Sigillaria ovata Sauveur.

Sigillaria ovata. Ante, pp. 56 & 78.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

Sigillaria saullii Brongt.

Sigillaria saullii Brongt., Hist. d. végét. foss., p. 456, pl. cli.

Sigillaria saullii Goldenberg, Flora saræpont. foss., heft ii., p. 31, pl. viii., fig. 22.

Sigillaria saullii Weiss, Aus. d. Steink., p. 5, pl. i., fig. 7, 1882.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

NOTE.—Very rare; one small specimen of the few found shews the cone scars.

Sigillaria reniformis Brongt.

Sigillaria reniformis Brongt., Hist. d. végét. foss., p. 470, pl. cxlii.

Sigillaria reniformis Goldenberg, Flora saræpont. foss., heft ii., p. 50, pl. viii., fig. 31.

Sigillaria reniformis Sauveur, Végét. foss. d. terr. houil. Belgique, pl. l., fig. 1.

Sigillaria reniformis Lesquereux, Coal Flora, p. 501, pl. lxx., figs. 5—9.

Sigillaria reniformis Schimper, Traité d. paléont. végét., vol. ii., p. 94, pl. lxviii., fig. 9.

Sigillaria reniformis Schimper in Zittel., Handbuch d. palæont, vol. ii., p. 200, fig. 150.

Sigillaria reniformis Kidston, Trans. Roy. Soc. Edin., vol. xxxv., p. 327, pl., fig. 11.

Sigillaria reniformis Weiss, Aus. d. Steink., p. 6, pl. ii., fig. 15, 1882.

Sigillaria reniformis Zeiller, Flore foss. d. bassin houil. d. Valen., p. 556, pl. lxxxiv., figs. 4—6.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—South Kirby Colliery, near Pontefract; Monckton Main Colliery, near Barnsley.

Sigillaria camptotœnia Wood sp.

Sigillaria camptotœnia. Ante, p. 79.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

Sigillaria lævigata Brongt.

Sigillaria lævigata Brongt., Hist. d. végét. foss., p. 471, pl. cxliii.

Sigillaria lævigata Goldenberg, Flora saræp. foss., heft ii., p. 51, pl. viii., fig. 32.

Sigillaria lævigata Kidston, Trans. Roy. Soc. Edin., vol. xxxiii., p. 398, pl. xxviii., fig. 5.

Sigillaria lævigata Zeiller, Flore foss. d. bassin houil. d. Valen., p. 519, pl. lxxviii., figs. 1—4.

Sigillaria lævigata Achepohl, Niederrh. Westfäl. Steink., p. 91, pl. xxx., fig. 5.

Sigillaria lævis Sauveur, Végét. foss. d. terr. houil. Belgique, pl. l., fig. 2.

Sigillaria distans Sauveur, ibid., pl. lv., fig. 1.

Sigillaria cycloidea Boulay, Terr. houil. du Nord de la France, p. 41, pl. iv., fig. 5.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Pit one mile north of Wakefield.

NOTE.—Recorded in error in First Report (Ante, p. 56) as *Sigillaria ovata* Sauveur.

Sigillaria tenuis Achepohl.

Sigillaria tenuis Achep., Niederrh. Westfäl. Steink., explan. to pl. iv^bis.^, pl. iv^bis.^, fig. 42.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

NOTE.—Very rare; only a single specimen has yet come under my observation from Yorkshire.

Sigillaria tessellata Brongt.

Sigillaria tessellata. Ante, pp. 57 & 79.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

CORDAITEÆ.

CORDAIANTHUS GRAND'EURY.

Cordaianthus pitcairniæ. Ante, pp. 60 & 81.

MIDDLE COAL MEASURES.

Hor.—*Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

SEEDS.

CARPOLITHUS STERNB.

Carpolithus bivalvis. Ante, p. 64.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

ROOTLETS.

PINNULARIA L. & H.

Pinnularia prostrata Artis, sp.

Pinnularia prostrata. Ante, p. 64.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

Hor.—*Black Bed Ironstone.* Loc.—Low Moor (James Spencer).

THE CARBONIFEROUS FLORA OF YORKSHIRE.

FOURTH REPORT

On behalf of the Yorkshire Fossil Flora Committee for 1892.

ROBERT KIDSTON, F.R.S.E., F.G.S.

The fourth Report of the Yorkshire Fossil Flora Committee, which I have now the pleasure of presenting, contains records of eleven species which are new to the Yorkshire Coal Field, and one variety of a previously recorded species.

These are,—*Equisetum hemingwayi*, *Sphenopteris dilatata*, *phenopteris furcata*, *Hymenotheca dathei* (recorded in first Report as *Sphenopteris* sp., allied to *furcata*), *Lepidodendron lycopodioides*, *Sigillaria rugosa*, *Sigillaria elongata*, *Dorycordaites palmæformis*, *Cardiocarpus cordai*, *Cardiocarpus fluitans*, *Carpolithus ovoideus*, and *Calamitina varians* var. *insignis*.

Lepidodendron dichotomum, previously recorded, must be deleted from the Yorkshire Fossil Flora, as I now find that all the stems placed under that name in the first Report belong to *Lepidodendron lycopodioides*. *Odontopteris binervosa* Achep. must also be removed from the list of Yorkshire species, as it is now found to be only the upper portion of the frond or pinnæ of *Neuropteris obliqua* Brongt. sp.

With the exception of three records, one each from Messrs. Davis, Spencer, and Gelder, all the others in the present Report result from the labours of Mr. Hemingway. In the previous Reports I have referred to the opportunities for collecting fossil plants which are being allowed to slip, and in this one the same remark must be again made. From an interview I had this

summer with the Committee's Secretary, Mr. Cash, there is good reason to believe that in the Halifax area some greater activity will be taken in collecting fossil plants in the near future, but, in many districts of Yorkshire, where fossil plant collecting could be prosecuted with undoubted success, nothing at all is being done at present.

There still remain a few specimens which I have not yet been able to satisfactorily determine, and most of these await the discovery of better preserved examples.

A complete list of the species contained in these Reports is appended to this one, as it will serve both as a *synopsis* of all the Yorkshire species as far as is at present known, and at the same time form an *Index* to the four Reports.

In conclusion, the Committee have again to thank all those who have assisted them in carrying on these investigations.

SYNOPSIS OF ADDITIONAL SPECIES AND NEW LOCALITIES.

CALAMARIÆ.

CALAMITES Suckow.

Group I.—CALAMITINA Weiss.

Calamites varians Sternb.

Ante, pp. 16, 66, 85.

Additional locality.

Middle Coal Measures.

Hor.—*Woolley Edge Rock.* Loc.—Smithies, near Barnsley.

Calamitina varians var. **insignis** Weiss.

Calamites (Calamitina) varians var. *insignis* Weiss, Steinkohl. Calamarien, part II., pp. 62, 63, pl. i., and pl. xxviii., fig. 1.

Calamites varians Germar, Vers. v. Wettin u. Löbejun, heft. iv., p. 47, pl. xx.

Calamites varians Schenk in Richthofen's China, vol iv., p. 234, pl. xxxv., fig. 5 (? pl. xxxiv., fig 1), 1883.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

Calamitina undulata Sternb. sp.

Stylocalamites undulatus, Ante, pp. 20, 68, 85.

Additional localities.

Middle Coal Measures.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

REMARKS.—Zeiller (Flore foss. d. bassin houil. d. Valen., p. 339) has suggested, on account of the apparent periodic occurrence of the branch scars on *Calamites undulatus*, that it might perhaps belong to Weiss' *Calamitina*, but not having sufficiently perfect specimens to determine the number of intervening branchless nodes, he retained the species in *Calamites.* Specimens received from Mr. Hemingway confirm M. Zeiller's opinion. These examples show that the number of branchless nodes which intervene between those bearing branches, is very irregular. One specimen where two nodes bearing branches are preserved shews that between the branch-bearing nodes, only two branchless nodes occur. On another specimen, after a branch-bearing node, eight nodes occur without any trace of branches, and in a third case nine branchless nodes are shown without the occurrence of a second branch-bearing node. Sometimes the internodes succeeding a branch-bearing node are much shortened, in other cases their length is about equal to the other intervening branchless internodes.

Another point which shews *Calamitina* to be the true place for *Calamites undulatus* is its possessing a smooth outer surface as evidenced by a portion of the bark possessing *Calamitina* characters still attached to one of the casts of *Calamites undulatus.*

GROUP III.—STYLOCALAMITES WEISS.

Stylocalamites suckowii Brongt. sp.

Ante, pp. 19, 67, 85.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Woolley Edge Rock.* Loc.—Smithies, near Barnsley.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

CALAMOCLADUS Schimper.

Calamocladus charæformis Sternb. sp.

Ante, pp. 22, 86.

Additional locality.

Middle Coal Measures.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

EQUISETACEÆ.

EQUISETUM L.

Equisetum hemingwayi Kidston.

Equisetum hemingwayi Kidston, Ann. and Mag. Nat. Hist., Feb, 1892, p. 138, fig. (p. 140).

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

Remarks.—Although many specimens from the Coal Measures have been described as *Equisetites*, there is little evidence to show that they had any real relationship to the *Equisetaceæ.* It was therefore only on the description of *Equisetum monyi* by MM. Renault and Zeiller (Comptes Rendus, Paris, January 5, 1885) from the Comentry Coal Field, that the genus *Equisetum* was determined to occur in carboniferous times. Their specimen consists of a portion of a stem. (See figure in Études sur le terr. houil. d. Comentry, Flore fossile, part II., p. 394, pl. lvii., fig. 7, 1890).

On several occasions I had received from Mr. Hemingway specimens of a small fossil, but which, owing to the imperfection of the earlier material submitted to me, I could not determine. Eventually, Mr. Hemingway was successful in discovering very perfect specimens of the small Equisetaceous cone, which in the early part of this year I described and figured as *Equisetum hemingwayi.* This is one of the most interesting additions to the British

Coal Flora which has been made for many years, for these cones, taken in conjunction with the discovery of the stem in France, conclusively carry back the genus *Equisetum* to carboniferous times.

The French specimen came from the Upper Coal Measures, whereas the Yorkshire specimens are from the Middle Coal Measures.

FILICACEÆ.

SPHENOPTERIS Brongt.

Sphenopteris dilatata L. & H.

Sphenopteris dilatata L. & H., Fossil Flora, vol. i., pl. xlvii., 1832.

Sphenopteris höninghausi Salter (*not* Brongt.), Mem. Geol. Survey of Gt. Brit.; Iron Ores of Gt. Brit., part III.; Iron Ores of South Wales, p. 232, fig. 2, 1861.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—East Gawber Colliery, near Barnsley; Monckton Main Colliery, near Barnsley; South Kirby Colliery, Pontefract.

Sphenopteris furcata Brongt.

Sphenopteris furcata Brongt., Hist. d. végét. foss., p. 179, pl. xlix., figs. 4—5.

Sphenopteris furcata L. & H., Fossil Flora, vol. iii., pl. clxxxi.

Sphenopteris furcata Sauveur, Végét. foss. d. terr. houil. Belgique, pl. xviii., figs 1—2.

Hymenophyllites furcatus Geinitz, Vers. d. Steinkf. in Sachsen, p. 17, pl. xxiv, fig. 10 (? figs. 8, 9, 11, 12, 13).

Diplothmema furcatum Stur, Carbon. Flora d. Schatz. Schicht, vol. i., p. 299, pl. xxviii, figs. 2—3.

Diplothmema furcatum Zeiller, Végét. foss. d. terr. houil, p. 45, pl. clxii., fig. 3.

Diplothmema furcatum Zeiller, Foss. flora d. bassin houil. d. Valen., p, 147, pl. iv., figs. 5—6, pl. v., fig. 4.

Sphenopteris sp. Lebour, Illustr. of Fossil Plants, pl. xli.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—East Gawber Colliery, near Barnsley; South Kirby Colliery, near Pontefract.

Sphenopteris spiniformis Kidston, n. sp.

Sphenopteris spinosa Kidston (not Göpp.), Ante, pp. 29, 70.

Sphenopteris artemisiæfolia Sauveur (*in part, not* Sternb.), Végét. foss. d. terr. houil. de la Belgique, pl. xx., figs. 1—2, 1848.

REMARKS.—An examination of a larger number of specimens of the fern I originally placed under *Sphen. spinosa* Göpp., has shewn me that the identification of the fossils as such is an error. The Yorkshire fern is similar to that figured by Sauveur, on his pl. xx, figs. 1—2 (*not* fig. 3) as *Sphenopteris artemisiæfolia*, from which species, however, his plant is essentially distinct. Zeiller unites these two figures of Sauveur's *Sphenopteris artemisiæfolia*, along with the *Sphenopteris stricta* Sauveur (*not* Sternb.) under Crépin's *Sphenopteris artemisiæfolioides.* (Zeiller, Flore foss. d. bassin houil. d. Valen., p. 132). I have not been able to consult the original work in which Crépin first proposed the name of *Sphenopteris artemisiæfolioides* and therefore do not know what synonymy he gave for his species in Mourion, Géol. de la Belgique, vol. ii., p. 60, as quoted by Zeiller.

I have a specimen of *Sphenopteris artemisiæfolioides* which I received from Mons. Crépin a few years ago, and do not think it possible to unite with it Sauveur's figures 1—2 of *Sphenopteris artemisiæfolia*, though I have no doubt *Sphenopteris stricta* Sauveur (*not* Sternb.) is the same as Crépin's *Sphenopteris artemisiæfolioides.* I have, therefore, proposed the name of *spiniformis* for the plant figured by

Sauveur (pl. xx., figs. 1—2, *not* fig. 3), as the pinnæ, and frequently the pinnules, end in spine-like points, from which character I originally referred the species to *Sphenopteris spinosa* Göpp.

Owing to the indistinctness of his figure and the absence of description and details of the pinnule cutting and nervation, I cannot determine whether or not Stur's *Archæopteris sauveuri* (Stur, Carbon Flora, Schatz. Schicht. Die Farne, pl. xxxv., fig. 2, 1885, without description) should be placed here. But as his plant is evidently not an *Archæopteris*, but a *Sphenopteris*, and as there is already a *Sphenopteris sauveuri* Crépin (Bull. Soc. Roy. de Belgique, vol. xix., part ii., p. 17) a new specific name is necessary in any case.

RENAULTIA Zeiller.

Renaultia footneri Marrat sp.

Sphenopteris footneri, Ante, pp. 31, 71.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Acton Hall Colliery, near Pontefract.

Note.—Fruiting specimens of this fern, received from Mr. Hemingway, shew that this species must be placed in the genus *Renaultia*. It may be further noted that, according to Zeiller's figures of *Sphen. (Renaultia) gracilis* Brongt. (Flore foss. d. bassin houil. d. Valen., p. 94, pl. iv., figs. 2—3), *Renaultia footneri* must be united with that fern. Brongniart's type of *Sph. gracilis* (Hist. d. végét. foss., p. 197, pl. liv., fig. 2) came from near Newcastle-on-Tyne, and I incline to the union of the two species, but the subject requires to be further looked into.

EREMOPTERIS Schimper.

Eremopteris artemisiæfolia Sternb. sp.

Ante, p. 89.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

CROSSOTHECA ZEILLER.

Crossotheca schatzlarensis Stur, sp.

Ante, pp. 33, 72.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*White Rake Bed.* Loc.—Low Moor (J. W. Davis).

HYMENOTHECA POTOMIE.

Hymenotheca Potomie, Jahrb. d. König. preuss. geol. Landesanstalt für 1889, p. 21, 1890.

Hymenotheca dathei Potomie.

Hymenotheca dathei Potomie, Ueber einige Carbonfarne, Jahrb. d. Königl. preuss. geol. Landesanst. für 1889, p. 21, 1890.

Sphenopteris (allied to *furcata* Brongt.), ante, p. 32.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Wakefield (W. Hemingway).

REMARKS.—The specimens included in my first Report under the name of *Sphenopteris* (allied to *furcata* Brongt.) must be placed in Potomie's genus *Hymenotheca.* In the same genus Potomie places the *Hymenophyllum weissii* Schimper (Traité d. paléont. végét., vol. i., p. 415, pl. xxviii., figs 4—7). The enlargements as given by Schimper are inaccurate, and in regard to these it has already been pointed out that the fossil could not be placed in the recent genus *Hymenophyllum* as proposed by Schimper. (See Kidston, Trans. Geol. Soc. Glasgow, vol. ix., p. 14, 1891).

MARIOPTERIS Zeiller.

Mariopteris muricata Schl. sp.

Ante, pp. 34, 72, 89.

Additional localities.

Middle Coal Measures.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Barnsley Thick Coal.* Loc.—Woolley Colliery, Darton, near Barnsley.

DACTYLOTHECA Zeiller.

Dactylotheca plumosa Artis sp.

Sphenopteris crenata, Ante, p. 30.

Dactylotheca plumosa, Ante, p. 35.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—South Kirby Colliery, near Pontefract.

Remarks.—From the examination of additional specimens, from several Coal Fields, both barren and in fruit, I am led to believe that *Sphenopteris crenata* L. & H., and the *Filicites plumosa* Artis, were only founded on different portions of the fronds of one species, and, further, that *Pecopteris dentata* Brongt., which I formerly regarded as a variety of *Dactylotheca plumosa*, is specifically distinct from it.

Dactylotheca dentata Brongt. sp.

Dactylotheca plumosa var. *dentata*, Ante, p. 30.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—South Kirby Colliery, near Pontefract; Monckton Main Colliery, near Barnsley.

ALETHOPTERIS Sternb.

Alethopteris lonchitica Schl. sp.

Ante, pp. 37, 73, 89.

Middle Coal Measures.

Additional localities.

Hor.—*Barnsley Thick Coal.* Locs.—North Gawber Colliery, Mapplewell, near Barnsley; Ackton Hall Colliery, Featherstone, near Pontefract.

Hor.—*Old Hards Coal.* Loc.—Flockton, near Huddersfield.

Hor.—*Stanley Main Coal.* Loc.—Walton, near Wakefield.

Alethopteris decurrens Artis sp.

Ante, pp. 38, 73, 90.

Additional locality.

Middle Coal Measures.

Hor.—*Silkstone Seam.* Loc.—Furnace Main Colliery, Cawthorne, near Barnsley.

Alethopteris davreuxi Brongt. sp.

Ante, pp. 73, 90.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—East Gawber Colliery, near Barnsley.

NEUROPTERIS Brongt.

Neuropteris heterophylla Brongt.

Ante, pp. 40, 74, 90.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Ackton Hall Colliery, Featherstone, near Pontefract.

Hor.—*Shale on the horizon of the Woolley Edge Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Stanley Main Coal.* Loc.—Walton, near Wakefield.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, near Pontefract.

Neuropteris tenuifolia Schl. sp.

Ante, pp. 41, 75, 90.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, near Pontefract.

Neuropteris gigantea Sternb.

Ante, pp. 41, 75, 91.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—Hemsworth Colliery, near Pontefract; Ackton Hall Colliery, Featherstone, near Pontefract.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, near Pontefract.

Neuropteris obliqua Brongt. sp.

Neuropteris obliqua, Ante, pp. 42, 75.

Odontopteris binervosa Achep., Ante, pp. 39, 74.

REMARKS.—I now find that the *Odontopteris binervosa* Achepohl must be reduced to a synonym of *Neuropteris obliqua* Brongt. sp.

It has been founded on the upper portion of a pinna, on which the pinnules are united by the whole breadth of their base, a constant character on the uppermost portions of the pinnæ of *Neuropteris*, though it is, perhaps, more marked in this species of the genus than in most of the other members.

Neuropteris acuminata Schl. sp.

Ante, p. 91.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

MEGAPHYTON Artis.

Megaphyton frondosum Artis.

Ante, p. 43.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

LYCOPODIACEÆ.

LEPIDODENDRON Sternb.

Lepidodendron lycopodioides Sternberg.

Lepidodrendon sternbergii Kidston (*not* Sternb.), Ante, p. 44.

Lepidodendron lycopodioides Sternb., Ess. fl. monde prim., vol. i., fasc. ii., pp. 29, 35, pl. xvi., figs. 1, 2, 4.

Lepidodendron lycopodioides Zeiller, Végét. foss. du terr. houil., p. 111, pl. clxxi., fig. 1.

Lepidodendron lycopodioides Renault, Cours d. botan. foss., vol. ii., p. 14, pl. v., fig. 8.

Lepidodendron lycopodioides Zeiller, Flore foss. d. bassin houil. d. Valen., p. 464, pl. lxix., figs. 2—3, pl. lxx., fig. 1.

Lepidodendron elegans Brongt., Prodrome, p. 85.

Lepidodendron elegans Brongt., Hist. d. végét. foss., vol. ii., p. 35, pl. xiv.

Lepidodendron elegans L. & H., Foss. Flora, vol. ii., pl. cxviii.

Lycopodiolites elegans Sternb., Ess. fl. monde prim., vol. i., fasc. iv., p. viii.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—Monckton Main Colliery, near Barnsley; Ackton Main Colliery, Featherstone.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, near Pontefract.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

REMARKS.—A careful examination of the Coal Measure *Lepidodendra* since the first Report was handed in, has shewn me that the specimens placed under *Lepidodendron dichotomum* in my first Report are referable to *Lepidodendron lycopodioides* Sternb. Since the first Report was completed, I have elsewhere stated my difficulty in ascertaining the critical characters for the identification of *Lepidodendron dichotomum* Sternb. (*in part*), (= *Lepidodendron sternbergii* Brongt.) (See Proc. Roy. Phys. Soc. Edin., vol. x., p. 350, 1891.)

Zeiller figures a *Lepidodendron* which he believes to be the *Lepidodendron dichotomum* of Sternberg (Végét. foss. d. terr. houil., p. 107, pl. clxxii., fig. 1; Flore foss. d. bassin houil. d. Valen., p. 446, pl. lxvii., fig. 1). This plant I know, and it occurs in Britain, but it is very rare, and hitherto I have only seen it in the Upper Coal Measures, and with it none of the Yorkshire examples agree. Should Zeiller be right in the identification of his specimens, the specific position of *Lepidodendron dichotomum* would be very clear, but I am doubtful of the correctness of the identification of his specimens with Sternberg's species, and I do not think that the figure given by Presl (in Sternberg., Vers. ii., p. 177, pl. lxviii, fig. 1) at all settles the point, for, firstly, I am not aware on what grounds Presl so identifies his specimen, which appears to me different from Sternberg's somewhat unsatisfactory

original figures; and, secondly, his (Presl's) fig. 1 is much more like a *Lepidophloios* than a *Lepidodendron*, and it is difficult to understand how the figure 1, if correctly drawn, could afford data for the enlarged figures 1[a].

Lepidodendron ophiurus Brongt.

Ante, pp. 45, 76.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Colliery, near Pontefract.

Lepidodendron obovatum Sternb.

Ante, pp. 46, 76.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Silkstone Coal.* Loc.—Furnace Main Colliery, Cawthorne, near Barnsley.

Lepidodendron aculeatum Sternb.

Ante, pp. 46, 76, 91.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, Pontefract.

Lepidodendron wortheni Lesqx.

Ante, pp. 48, 77, 92.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Ackton Hall Colliery, Featherstone, near Pontefract.

Hor.—*Stanley Main Coal.* Loc.—Walton, near Wakefield.

LEPIDOSTROBUS Brongt.

Lepidostrobus lanceolatus L. & H. sp.

Ante, pp. 50, 77.

Additional locality.

Middle Coal Measures.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Lepidostrobus geinitzii Schimper.

Ante, p. 52.

Additional locality.

Lower Coal Measures.

Hor.—*Soft Bed Coal.* Loc.—Shibden Head, near H fax (W. Cash).

BOTHRODENDRON L. & H.

Bothrodendron punctatum L. & H.

Ante, p. 92.

Additional locality.

Middle Coal Measures.

Hor.—*Shale over Oaks Coal.* Loc.—Hoyle Mill, Barnsley.

Bothrodendron minutifolium Boulay sp.

Ante, pp. 52, 77.

Additional locality.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Ackton Hall Colliery, Featherstone, near Pontefract.

SIGILLARIA Brongt.

Sigillaria lævigata Brongt.

Ante, p. 95.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs.—Monckton Main Colliery, near Barnsley; Ackton Hall Colliery, Featherstone, near Pontefract.

Sigillaria ovata Sauveur.

Ante, pp. 56, 78, 94.

Additional localities.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Loc.—Ackton Hall Colliery, Featherstone, near Pontefract.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, Featherstone, near Pontefract.

Sigillaria rugosa Brongt.

Sigillaria rugosa Brongt., Hist. d. végét. foss., p. 476, pl. cxliv., fig. 2, 1836.

Sigillaria rugosa Roehl, Foss. Flora d. Steink. Form. Westph., p. 110, pl. xxx, fig. 4, 1869.

Sigillaria rugosa Zeiller, Végét. foss. du terr. houil., p. 126, pl. clxxiii., fig. 3, 1880.

Sigillaria rugosa Schimper, in Zittel, Handb. d. Palæont., vol. ii., p. 200, fig. 148, 1880.

Sigillaria rugosa Weiss Aus. d. Steink., 2nd ed., p. 6, pl. ii., fig. 16, 1882.

Sigillaria rugosa Goldenberg (*in part*), Flora saræp. foss., heft ii., p. 48 (? pl. viii., fig. 26), 1857.

Sigillaria rugosa Zeiller, Flore foss. d. bassin houil. d. Valen., p. 551, pl. lxxx., figs. 1—5, 1886; text, 1888.

Sigillaria rugosa Grand'Eury, Bassin houil. du Gard, p. 255, pl. xii., fig. 2.

Sigillaria cristata Sauveur, Végét. foss. de la Belgique, pl. lviii., fig. 2, 1848.

Sigillaria subrotunda Roehl (*not* Brongt.), Foss. flora d. Steink. Form. Westph., p. 103, pl. xxvi., fig. 9, 1869

Sigillaria solena Wood, Trans. Amer. Phil. Soc., vol. xiii., p. 341, pl. viii., fig. 5, 1869.

Sigillaria marginata Lesqx., Atlas to the Coal Flora, pl. lxxi., fig. 5, 1879, (text) Coal Flora, p. 498, 1880.

Sigillaria lacoei Lesqx., Atlas to the Coal Flora, pl. lxxii., fig. 12, 1879, (text) Coal Flora, p. 499, 1880.

Middle Coal Measures.

Hor.—*Barnsley Thick Coal.* Locs. — Monckton Main Colliery, near Barnsley; Woolley Colliery, Darton, near Barnsley.

Note.—*Sigillaria deutschiana* Brongt., *Sigillaria rugosa* Brongt., and *Sigillaria elongata* Brongt., form a group of very closely related species, which should be very carefully collected whenever an opportunity offers.

Sigillaria elongata Brongt.

Sigillaria elongata Brongt., Prodrome, p. 64, 1828. Hist. d. végét. foss., p. 473, pl. cxlv., pl. cxlvi., fig. 2, 1836.

Sigillaria elongata Sauveur, Végét. foss. terr. houil. de la Belgique, pl. lvi., figs. 2—3, 1848.

Sigillaria elongata Goldenberg, Flora saræp. foss., heft ii., p. 46, pl. viii., figs. 23, 24, 25, 1857.

Sigillaria elongata Roehl, Foss. flora d. Steink. Form. Westph., p. 108, pl. xxx., fig. 1 (fig. not very accurate), 1869.

Sigillaria elongata Schimper, Traité palæont. végét., vol. ii., p. 91, pl. lxviii., fig. 8, 1870.

Sigillaria elongata Schimper, in Zittel, Handb. d. Palæont., vol. ii., p. 200, fig. 147, 1880.

Sigillaria elongata Weiss, Aus d. Steink, 2nd ed., p. 6, pl. ii., figs. 13—14, 1882.

Sigillaria elongata Zeiller, Ann. d. Sc. Nat., 6, Sér. Bot., vol. xix., p. 269, pl. xii., fig. 7, 1884.

Sigillaria elongata Zeiller, Flore foss. d. bassin houil. d. Valen., p. 545, pl. lxxxi., figs. 1—9, 1886; text, 1888.

Sigillaria cortei Brongt., Hist. d. végét. foss., vol. i., p. 467, pl. cxlvii., figs. 3—4, 1836.

Sigillaria cortei Geinitz (*in part*), Vers. d. Steinkf. in Sachsen, p. 45, pl. vi., figs. 1—2 (*not* fig. 3 nor pl. ix., fig. 7) 1855.

Sigillaria cortei Goldenberg, Flora saræp. foss., heft ii., p. 47, pl. viii., fig. 12.

Sigillaria cortei Roehl., Foss. flora d. Steink.-Form. Westph., p. 109, pl. xxx., fig. 2, 1869.

Sigillaria cortei Zeiller, Végét. foss. d. terr. houil., p. 128, pl. clxxiv., fig. 4, 1880.

Sigillaria cortei Renault, Cours d. botan. foss., vol. i., p. 133 (pl. xvii., fig. 6 ?) 1881.

Sigillaria cortei Grand'Eury, Bassin houil. du Gard., p. 254, (? ? pl. x., fig. 6), 1890.

Sigillaria intermedia Brongt., Hist. d. végét. foss., p. 474, pl. clxv., fig. 1, 1836—7.

Sigillaria intermedia Goldenberg, Flora saræp. foss., heft. ii., p. 45, pl. viii., fig. 18, 1857.

Sigillaria intermedia Geinitz, Vers. d. Steinkf. in Sachsen, p. 46, pl. vii., figs. 1—2, 1855.

Sigillaria græseri Brongt., Hist. d. végét. foss., p. 454, pl. clxiv., fig. 1, 1836—7.

Sigillaria græseri Goldenberg, Flora saræp. foss., heft. ii., p. 33, pl. viii., fig. 14, 1857.

Sigillaria græseri Weiss, Aus. d. Steink., 2nd ed., p. 6, pl. iii., fig. 18, 1882.

Sigillaria gracilis Brongt., Hist. d. végét. foss., p. 462, pl. clxiv., fig. 2, 1836—7.

Sigillaria gracilis Goldenberg, Flora saræp. foss., heft. ii., p. 40, pl. viii., fig. 15, 1857.

Sigillaria minuta Sauveur, Végét. foss. terr. houil. de la Belgique, pl. lv., fig. 2, 1848.

Sigillaria davreuxi Sauveur (*not Brongt.*), ibid., pl. lvi., fig. 4, 1848.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—Monckton Main Colliery, near Barnsley; South Kirkby Colliery, near Pontefract.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, near Pontefract.

REMARKS.—Few *Sigillariæ* differ more in appearance at different stages of growth or when imperfectly preserved than *Sigillaria elongata.* This has given rise to the creation of several species, which further study has shown must be all placed under one name.

Sigillaria saullii Brongt.

Ante, p. 94.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Ackton Hall Colliery, Featherstone, near Pontefract.

SPHENOPHYLLEÆ.

SPHENOPHYLLUM BRONGT.

Sphenophyllum cuneifolium Sternb. sp.

Ante, pp. 25, 69, 87.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Locs.—Hemsworth Colliery, near Pontefract; Ackworth Hall Colliery, Featherstone, near Pontefract.

Sphenophyllum trichomatosum Stur.

Ante, pp. 27, 70, 87.

Sphenophyllum tenerrimum Weiss (not Ett.), Aus. d. Steink. ed. 1882, p. 12, pl. x, fig. 63.

Sphenophyllum tenerrimum Weiss (not Ett.), Steinkohl. Calamar. vol. ii, p. 199, pl. xvi., fig. 4, 5, 1884.

Sphenophyllum tenerrimum Achepohl (not Ett.), Niederr. Westfäl. Steink., p. 136, pl. xli., fig. 12; Suppt. pl. iv., fig. 76.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Barnsley Thick Coal.* Loc.—Hemsworth Colliery, near Pontefract.

Hor.—*Stanley Main Coal.* Loc.—Walton, near Wakefield.

CORDAITEÆ.

CORDAITES UNGER.

The *Cordaites* have been divided into four groups:—

I.—CORDAITES (or EUCORDAITES).

II.—DORYCORDAITES.

III.—POACORDAITES.

IV.—SCUTOCORDAITES.

The first three divisions were proposed by Grand'Eury, (Flore Carbon. du Départ. de la Loire, etc., pp. 208, 214, 222, 1877), and the last was founded by Renault and Zeiller (Comptes Rendus, 23 March, 1885; see also Flore foss. terr. houil. de Comentry, p. 603, 1890). Of these, only the two first groups have been found in Yorkshire, which are distinguished as follows:—

I.—**Cordaites.** Leaves simple, sessile, entire, lanceolate, *rounded at the summit, spathulate, obovate or elliptical,* generally very large, twenty to ninety centimetres long, coriaceous, veins parallel, fine, equal or unequal, and running throughout the whole length of the leaf.

II.—**Dorycordaites.** Leaves simple, sessile, entire, lanceolate, slender, forty to fifty centimetres long, veins equal, numerous and distinct, and running throughout the whole length of the leaf; *apex of leaf always terminating in a point* (*not rounded as in Group I.*).

Owing to the manner in which the leaves split up at the apex it is seldom that the leaf extremities are found in such a condition as to show their perfect outline.

Cordaites principalis Germar sp.

Ante, pp. 58, 80.

Middle Coal Measures.

Additional locality.

Hor.—*Shale over Chevet Rock.* Loc.—Cadeby Colliery, Conisborough.

Dorycordaites (Cordaites) palmæformis Göpp. sp.

Dorycordaites palmæformis Zeiller, Flore foss. d. bassin houil. d. Valen., p. 632, pl. xciii., figs. 1, 2, 1890.

Cordaites (*Dorycordaites*) *palmæformis* Grand'Eury, Flore carbon. du Départ. de la Loire, p. 214, pl. xviii., figs. 4, 5, 1877.

Cordaites (*Dorycordaites*) *palmæformis* Renault, Flore foss. terr. houil. de Comentry, part II., p. 585, pl. lxvi., figs. 1-7, 1890.

Cordaites (*Dorycordaites*) *palmæformis* Grand'Eury, Bassin houil. du Gard, p. 330, 1890.

Cordaites palmæformis Weiss, Foss. Flora d. jungst. Stk. u. Rothl., p. 199, pl. xviii., fig. 39, 1871.

Cordaites palmæformis Heer, Foss. flora Helv., p. 56, pl. i., fig. 18, 1876.

Noeggerathia palmæformis Göpp., Foss. Flora d. Ubergangs, p. 216, pl. xv.; pl. xvi., figs. 1-3, 1852.

Noeggerathia palmæformis Göpp. Foss. Flora d. perm. Form., p. 157, pl. xxi., fig. 2^b; pl. xxii., figs. 1, 2, 1864.

Noeggerathia palmæformis Geinitz, Vers. d. Steinkf. in Sachsen, p. 42, pl. xxii., fig. 7, 1855.

Pycnophyllum palmæforme Schimper, Traité d. paléont. végét., vol. iii., p. 563, 1874.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Manor House Colliery, Wakefield.

REMARKS.—*Dorycordaites palmæformis* is an addition to the Yorkshire Fossil Flora, and it seems either to have previously been overlooked or is very rare. Though I have seen it in England before it has not yet been recorded as British.

CARDIOCARPUS BRONGT.

Cardiocarpus cordai Geinitz sp.

Cardiocarpus cordai Zeiller, Flore foss. d. bassin houil. Valen., p. 645, pl. xciv., fig. 13, 1886.

Carpolithus cordai Geinitz, Vers. d. Steinkf. in Sachsen, p. 41, pl. xxi., figs. 7-16, 1855.

Carpolithus cordai Boulay, Terr. houil. du nord de la France, p. 50, pl. i., fig. 4, 1876.

Cyclocarpus cordai Weiss, Foss. Flora d. jüngst. Stk. u. Rothl., p. 207, 1871.

Cyclocarpus cordai Sterzel, Flora d. Rothl. in nordw. Sachs., p. 68, pl. ix., fig. 4, 1886.

MIDDLE COAL MEASURES.

Hor.—*Shale on the horizon of the Woolley Edge Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Stanley Main Coal.* Loc.—Manor House Colliery, Wakefield.

Cardiocarpus fluitans Dawson.

Cardiocarpum fluitans Dawson, Quart. Journ. Geol. Soc., vol. xxii., p. 165, pl. xii., fig. 74, 1866.

Cardiocarpum fluitans Dawson, Acad. Geol., 2nd. ed., p. 460, fig. 173[I], and p. 491, 1868.

Cardiocarpus fluitans Kidston, Trans. Roy. Soc. Edin., vol. xxxiii., p. 403, pl. xxiii., fig. 6, 1888.

Cardiocarpon Fiedler, Nov. Acad. nat. curios., vol. xxvi., p. 288, pl. xxviii., fig. 35, 1857.

Samaropsis fluitans Weiss, Foss. Flora d. jüngst. Stk. u. Rothl., p. 209, pl. xviii, figs. 24-30, 1871.

Samaropsis fluitans Grand'Eury, Flore carbon. du Dépt. de la Loire, p. 280, pl. xxxiii., fig. 3, 1877.

Samaropsis fluitans Weiss, Aus. d. Steink., 2nd ed., p. 19, pl. xx., fig. 121, 1882.

Samaropsis fluitans Zeiller, Flore foss. d. bassin houil. d. Válen., p. 644, pl. xciv., fig. 7, 1886.

Cardiocarpus cornutus Schimper (*in part, not Dawson*), Traité d. paléont. végét., vol. iii., p. 567, pl. cx., figs. 14-17, 1874.

MIDDLE COAL MEASURES.

Hor.—*Shale on the horizon of the Woolley Edge Rock.* Loc.—Cadeby Colliery, Conisborough.

Hor.—*Barnsley Thick Coal.* Loc.—Monckton Main Colliery, near Barnsley.

Hor.—*Stanley Main Coal.* Loc.—Manor House Colliery, Wakefield.

TRIGONOCARPUS BRONGT.

Trigonocarpus parkinsoni Brongt.

Ante, pp. 61, 81.

Additional localities.

MIDDLE COAL MEASURES.

Hor.—*Upper Chevet Rock.* Loc.—Quarry, Darfield, near Barnsley.

Hor.—*Lower Chevet Rock.* Loc.—Cudworth, near Barnsley.

Forma **amygdalæformis** Göpp. & Berg.

Hor.—*Haigh Moor Coal.* Loc.—Featherstone Main Colliery, near Pontefract.

Trigonocarpus noeggerathi Sternb. sp.

Ante, p. 62.

MIDDLE COAL MEASURES.

Additional locality.

Hor.—*Birdwell Rock.* Loc.—Birdwell, near Barnsley (Gelder).

RHABDOCARPUS GÖPP. & BERGER.

Rhabdocarpus elongatus Kidston.

Ante, pp. 63, 82.

Additional locality.

MIDDLE COAL MEASURES.

Hor.—*Stanley Main Coal.* Loc.—Walton, near Wakefield.

CARPOLITHUS STERNB.

Carpolithus ovoideus Göpp. & Berger.

Carpolithus ovoideus Kidston, Trans. Roy. Soc. Edin., vol. xxxiii., p. 404, pl. xxiii., figs. 7—8, 1888.

Carpolithus ovoideus Kidston, Trans. Roy. Soc. Edin., vol. xxxv., p. 330, plate, fig. 8, 1888.

Carpolithus ovoideus Grand'Eury, Bassin houil. du Gard, p. 334, 1890.

Cardiocarpus ovoideus Zeiller, Flore foss. d. bassin houil. et perm. d. Brive, p. 92, 1892.

Carpolithus membranaceus Göpp., Foss. Flora d. perm. Form., p. 178, (? pl. xxix., figs. 19-21), 1864.

Carpolithus membranaceus Göpp. in Berger, Fruct. et semin., p. 25, pl. ii., figs. 19, 20, 1848.

Rhabdocarpus ovoideus Berger, Fruct. et semin., p. 22, pl. l., fig. 17, 1848.

Rhabdocarpus ovoideus Göpp., Foss. Flora d. perm. Form., p. 173, pl. xxvii., figs. 9, 10, 1864.

Rhabdocarpus (?) *ovoideus* Weiss,. Foss. Flora d. jüngst. Stk. u. Rothl., p. 206, pl. xvii., fig. 4 ; pl. xviii., figs. 10-14, 18-21, 1871.

MIDDLE COAL MEASURES.

Hor.—*Shale on the horizon of the Woolley Edge Rock.* Loc.—Cadeby Colliery, Conisborough.

Carpolithus bivalvis Göpp.

Ante, pp. 64, 96.

Additional locality.

MIDDLE COAL MEASURES.

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NOTES FOR GUIDANCE in working out the Vertical and Horizontal distribution of the British Carboniferous Flora.

I.—As soon after collection as possible, label all specimens, stating—

(*a*) Full locality, giving name of pit, if collected at a colliery.

(*b*) Giving horizon,* when ascertainable.

(*c*) Name of collector.

II.—Collect all specimens, however small or uninteresting they may appear to be, and give great care to the collection of all fructifications—even when fragmentary—whether cones or fruit of ferns.

III.—On no account *varnish* the specimens, and if absolutely necessary to apply some preservative medium, use very weak, watery glue, and apply it by 'dabbing' gently with a soft sponge. It need hardly be added that all fingering of the surface of the specimen, or rubbing of any kind, ought to be avoided.

On collecting, wrap the fossils up singly in paper at once to prevent their being scratched or the carbon displaced while carrying them home. In mending broken specimens, gently heat each part before applying the glue.

IV.—In packing fossils for transit, wrap each separately in paper and pack with additional paper, straw, hay, or shavings in a strong box. *Never* use sawdust, husks, or any similar substance for packing.

V.—All specimens sent to me for examination to be numbered and accompanied with a list containing the numbers, localities, and any other additional particulars that may be thought necessary. Attention to this saves time and trouble to all parties.

ROBERT KIDSTON.

24, Victoria Place,
Stirling.

* 'Horizon,' *i.e.*, the name of the coal seam with which the shale was associated that contained the fossil, or any other particulars that will enable the exact *position* of the rock to be determined from which the fossil has been derived.